

# The Effect of Problem Based Learning (PBL) Learning Model and Learning Independence on Problem Solving Ability of Ali Bin Abu Talib Integrated Islamic Junior High School Students Deli Serdang

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## ARTICLE INFO

### Keywords:

Implementation; Problem Based Learning (PBL; Problem Solving

### Article history:

Received 2023-08-14

Revised 2024-05-12

Accepted 2024-06-16

## ABSTRACT

This study aims to determine and describe: (1) the effect of the application of the Problem Based Learning (PBL) learning model on the problem solving ability of IT Ali Bin Abu Talib Deli Serdang Junior High School students, (2) the effect of learning independence on the problem solving ability of IT Ali Bin Abu Talib Deli Serdang Junior High School students, and (3) the interaction between learning models and learning independence on the problem solving ability of IT Ali Bin Abu Talib Deli Serdang Junior High School students. This type of research uses a quantitative approach with an experimental model. The population of this research is all students of class VIII of Ali Bin Abu Talib IT Junior High School which consists of two classes. The sampling technique that will be used in this study is total sampling. Total sampling is the same sampling technique as the population. Data collection instruments are questionnaires and tests. Normality testing using Liliefors and homogeneity testing using Bartlett. The data analysis technique is two-way analysis of variance at  $\alpha = 0.05$ . The results showed: (1) there is an effect of the application of learning models on problem solving ability, this is evident from the results of statistical testing which shows  $F_{hitung} = 242.4 > F_{table} 3.972$ , (2) there is an effect of learning independence on problem solving ability, this is evident from statistical testing which shows  $F_{hitung} = 183.8 > F_{table} 3.972$ , and (3) there is an interaction between learning models and learning independence, this is evident from statistical testing which shows  $F_{hitung} = 86.3 > F_{table} 3.972$ .

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## INTRODUCTION

Problem solving ability is a mental and intellectual process in finding a problem and solving it based on accurate data and information, so that a precise and careful conclusion can be drawn. (Salahudin & Subhan, 2021) The problem-solving process provides opportunities for learners to play an active role in learning, searching and finding their own information or data to be processed into concepts, principles, theories or conclusions. (Susriyati & Yurida, 2019) In other words, problem solving demands the ability to process information to make certain decisions (Ansori & Herdiman, 2019) In teaching learners about problem solving, teachers should pay close attention to learners' experiences. (Novitasari, 2018) This is especially true among learners at lower levels of education. This is because children learn to solve problems through their experiences. (Budiarti, Musa'ad, & Supriadi, 2023). Teachers must play a role in being more innovative in using appropriate learning models in the learning process (Abidin, 2017). Among the learning models that are currently considered appropriate in learning fiqh is through problem-based learning. (Mulyono, 2016). By using problem-based learning,

learners will learn well if what they learn is related to what they already know and to activities or events that will happen around them. (Irawati, 2020) It emphasises high thinking, transfer of knowledge, collecting and analysing data, solving specific problems both individually and in groups. (Saleh, 2013)

In addition to the facts above, the results of the researcher's interview with the Jurisprudence teacher showed similar facts. It was found that students were less able to solve non-routine problems, lack of students' ability to identify problems given by teachers related to contextual problems. (Arisca, Karoma, Syarnubi, & Ahmad Syarifuddin, 2020) This shows that the lack of students' problem solving skills. (Alimron, Syarnubi, & Maryamah, 2023). A factor that also determines the success of learning is student learning independence. Learning independence emphasises student activity in learning which is full of responsibility for success in learning. (Setyanto, Fauzi, & Ibrahim, 2022) Students who have strong learning independence will not give up easily. (Ali & Syarnubi Syarnubi, 2020) Therefore, learning independence is very necessary and determines the success of learning, an independent attitude will lead students to success during their education. (Saprizal, Nindiasari, & Syamsuri, 2021)

Problem solving skills and learning independence play an important role in learning so that these two things must be developed. (Anshori, 2021). Meanwhile, learning independence must be improved because children who have learning independence will have confidence in their own abilities consciously, regularly, and disciplinedly trying hard in the learning process. (Sobri, M., 2014) According to (Sumarmo, 2004) Learning independence (self regulated) contains three characteristics, namely: 1) individuals design their own learning according to the needs or goals of the individual concerned, 2) individuals choose strategies and implement their learning designs, 3) individuals monitor their own learning progress, evaluate their learning outcomes compared to certain standards. (Ballanie, Dewi, & Syarnubi Syarnubi, 2023)

One way that teachers can do this is by applying a learning model that can support efforts to improve problem solving skills and learning independence. (Fauzi, Andriani, & Syarnubi, 2023) A teaching model is a plan or pattern used in structuring the curriculum, organising subject matter and instructing teachers in the classroom in a learning setting or other setting (Muslim, 2017). Based on initial observations, researchers saw that the learning process carried out by teachers was less innovative in determining learning models that were in accordance with the 2013 curriculum. As a result, teachers in the fiqh learning process activities tend to use conventional models which are dominated by lecture models. (Fitriyani, Dwi, Mansur, & Syarnubi, 2020) In conventional models, the teacher starts the lesson with lecture activities, questions and answers, the teacher concludes, and then proceeds with giving assignments. (Harto & Syarnubi Syarnubi, 2018) This learning model does not involve students in the learning process. (Febriyanti, Ismail, & Syarnubi, 2022) This causes students to be less active in learning so that students tend to only listen to explanations from the teacher without understanding the subject matter (Yustinaningrum, Fitri, & Juliana, 2022) When the teacher provides an opportunity to ask questions, students ask questions that are already in the package book provided from school so that it causes students' incomprehension, this also has an impact on student independence in their daily lives, because the expected learning process is not achieved (Kudsiyah, Novarina, & Suryani Lukman, 2017)

Learning Islamic Religious Education using the 2013 curriculum is expected to provide direct experience to students to understand Islamic Religious Education lessons thoroughly, be able to compile their own knowledge. (Syarnubi & Ahmad Syarifuddin Sukirman Sukirman, 2023) So that children develop thinking skills, increase the independence of students in the learning process, therefore students are encouraged to use their thinking skills in solving problems in everyday life. (Sukirman, Baiti, & Syarnubi, 2023). Competent educators are still unevenly distributed in Indonesia. There are still many teaching staff who do not have the competence in accordance with the demands of the curriculum. (Sutarmizi & Syarnubi, 2022) his is caused by various factors, including the lack of opportunities to participate in training and professional development. (Syarnubi Syarnubi, 2019) Whereas increasing the quantity and quality of education must continue to be carried out by the government, for example, rehabilitation and expansion of school buildings, provision of practical

equipment, curriculum improvement and increasing the professionalism of teaching staff accompanied by a teacher certification programme carried out nationally. (Syarnubi et al., 2023)

Problem solving skills are also needed to train students to get used to finding solutions to problems, if humans have good problem solving skills, then using the knowledge and skills they have will be able to find various kinds of solutions to the problems they face (Reski, Hutapea, & Saragih, 2019). Education is one of the processes of human character building. (Sukirman, Masnun, & Syarnubi, 2023) Education can also be said to be a process of humanising humans. (Hawi & Syarnubi, 2018) In all processes carried out by humans, there is an educational process that will produce attitudes and behaviours that eventually become their character, personality, or character. (Syarnubi, Alimron, & Muhammad, 2022). One of the solutions to this problem, a teacher chooses a learning model there are several things that need to be considered, namely learning objectives, material characteristics, and student characteristics. (Syarnubi Syarnubi, 2016) One of the learning models that can be used to improve problem solving skills and learning independence is the PBL model (Oktaviana & Haryadi, 2020) With this model students are trained to solve problems according to their knowledge and help students to find new knowledge so that students become more active in learning and learning becomes meaningful. (Yanti, Hawi, & Syarnubi, 2021)

Apart from testing thinking in solving problems, the problem-based learning model can also encourage students to have an attitude of learning independence, things that can be done by equalising the benefits of independent learning include fostering responsibility, improving skills, solving problems, and making decisions. (Sari, Sukardi, & Syarnubi, 2020). The difference between this research and previous research is that previous research focused on the short-term effects of certain learning models. However, in this research, the understanding of how the influence of PBL and learning independence can last or change in a longer period of time, both during school and daily life. The problem-solving ability assessment model in this study problem-solving ability is measured in depth about the most effective assessment tool or against changes in students' problem-solving ability caused by the PBL model and learning independence (Wulandari, Misdar, & Syarnubi, 2021) And this study also thoroughly explores how the effect of learning independence on problem-solving ability because the school under study implements a boarding school system. Based on this description, seeing the importance of problem solving skills and student learning independence in learning. The purpose of this study was to determine the effect of PBL model and learning independence on students' problem solving ability. On the basis of the considerations and problems that have been described, researchers want to conduct research to investigate the effect of problem-based learning (PBL) based learning models and learning independence on the problem solving ability of students of SMP IT Ali bin Abu Tholib Deli Serdang.

## METHODS

This type of research uses a quantitative approach. with the aim of testing a predetermined hypothesis, while quantitative data is data in the form of numbers. The model used in this research is an experimental model. This model is used to obtain information about the cause and effect between variables under controlled conditions. The location where this research was conducted was at Ali Bin Abu Talib IT Junior High School which is located at Jalan Bandar Labuhan, Gang Ali Bin Abu Talib, Hamlet 5, Bandar Labuhan Village, Tanjung Morawa District, Deli Serdang Regency. The research was conducted in the 2023/2024 school year. The research was conducted in a span of approximately 4 months, starting in January-April 2024.

The population used was class VIII students of SMP IT Ali Bin Abu Talib consisting of 2 classes. This study was conducted by total sampling, using the entire population as a sample, namely part of the control class and part of the experimental class. The reason used in the total sampling technique is because the population is less than 100. The sample to be used in this study were all students of class VIII SMP IT Ali Bin Abu Talib consisting of 2 classes with a total of 77 samples. The research design used in this study was factorial 2 x 2. The ones used are: 1) Free Variable; 2) Dependent Variable and 3) Mediator Variable. The data collection instruments used are questionnaires and tests. Normality

testing using Liliefors and homogeneity testing using Bartlett. The data analysis technique is two-way variance analysis at  $\alpha = 0.05$ .

## FINDINGS AND DISCUSSION

There is an effect of problem-based learning model (PBL) on the problem solving ability of VIII grade students of SMP IT Ali bin Abu Talib Deli Serdang. This is based on the calculation of factorial anova  $2 \times 2$  obtained  $F_{hitung} = 242.4$  while the  $F_{tabel}$  value = 3.972 for dk (1,73) and the real level  $\alpha = 0.05$ . it turns out that the value of  $F_{hitung} = 242.4 > F_{tabel} = 3.96$  so that hypothesis testing rejects  $H_0$  and accepts  $H_a$ . Thus the PBL learning model has a positive effect on the value of problem solving skills of junior high school students IT Ali Bin Abu Talib Deli Serdang. It can be concluded that the PBL learning model is one solution and is indeed often considered an effective approach in developing students' problem-solving skills that places students in the middle of real situations or problems, and encourages them to find solutions through collaboration, investigation, and reflection.

PBL involves several stages, including revealing a real problem, small group division, and analysis of results. These stages help students in developing ideas and critical thinking, as well as improving problem-solving skills. With the PBL learning model, students not only learn facts and concepts, but also practice how to apply their knowledge in a real-world context. They are invited to identify problems, analyse relevant information, design solution strategies, and evaluate the results. This process helps students develop their critical thinking skills, creativity, teamwork, and communication skills. However, it is important to note that the success of PBL in developing students' problem-solving skills also depends on its proper implementation by teachers and educational institutions. It requires careful planning, adequate support and continuous evaluation to ensure that learning objectives are achieved. Students must also have sufficient critical thinking skills to analyse problems and develop solutions and must have sufficient collaboration skills to work together with their peers in solving problems.

There is an influence of learning independence on the ability to solve learning problems of class VIII students of SMP IT Ali bin Abu Talib Deli Serdang. Based on the calculation of factorial anova  $2 \times 2$  obtained  $F_{hitung} = 183.8$  while the value of  $F_{tabel} = 3.972$  for dk (1,73) and the real level  $\alpha = 0.05$ . it turns out that the value of  $F_{hitung} = 183.8 > F_{tabel} = 3.96$  so that hypothesis testing rejects  $H_0$  and accepts  $H_a$ . Thus it can be concluded that there is an influence of the learning independence variable with the value of the problem solving ability of junior high school students IT Ali Bin Abu Talib Deli Serdang. Learning independence, or the ability of students to learn independently without relying on direct guidance from teachers, is indeed considered an important factor in the development of problem solving skills.(Martina, Khodijah, & Syarnubi, 2019) Various educational experts recognise that the ability to solve problems on their own allows students to become more independent in their thinking and take responsibility for their learning.

When students are able to learn independently, they are more likely to be able to find solutions to the problems they face. (Malta, Syarnubi Syarnubi, & Sukirman Sukirman, 2022) They can develop the reasoning, analysis and problem-solving skills needed to overcome the challenges faced in the learning process and everyday life. This is in line with what experts say that independence in learning gives individuals the freedom to explore different approaches and solutions to problems. This can encourage creativity and innovation, which are essential components of effective problem solving. (Hadi & Izzah, 2019). Based on the calculation of factorial anova  $2 \times 2$  obtained  $F_{hitung} = 86.3$  while the value of  $F_{tabel} = 3.972$  for dk (1,73) and the real level  $\alpha = 0.05$ . it turns out that the value of  $F_{hitung} = 183.8 > F_{tabel} = 3.96$  so that hypothesis testing rejects  $H_0$  and accept  $H_a$ . Thus it can be concluded that there is an interaction between the learning model and learning independence in influencing the value of the problem solving ability of students of SMP IT Ali Bin Abu Talib Deli Serdang.

Students' problem solving ability can be influenced by PBL learning model variables and learning independence variables.(Nurahman, Oviyanti, & Syarnubi Syarnubi, 2021) This is because PBL is a learning approach in which students are given problems that are relevant to real life and

then directed to find their own solutions. In this process, students are invited to actively seek information, analyse, and integrate knowledge from various sources to solve the problem at hand. This helps them develop problem-solving, critical thinking, collaboration and communication skills. (Misyuraidah, Misyuraidah, & Syarnubi, 2017). Learning independence, on the other hand, is the ability of students to organise and manage their own learning, including learning objectives, learning models, and assessment of their own progress. (Hartati, Achadi, Syarnubi, & Muhammad, 2022) By developing learning independence, students become more independent in facing learning challenges and are better able to overcome problems they encounter.

The combination of PBL and learning independence creates a learning environment that supports the effective development of students' problem-solving skills. Through PBL, students are given the opportunity to face real problems, while with independent learning, they are encouraged to take responsibility for their own learning. Thus, these two approaches together can help students develop problem-solving skills that are essential for facing real-life challenges. This is revealed by an expert Djamarah, namely the Problem-Based Learning (PBL) learning model affects learning independence and problem solving skills. PBL is designed to improve critical thinking and problem solving skills through orientation to learning through problems. In this model, students are given complex problems and must find their own solutions with the help of available resources. Thus, students are forced to think critically and search for relevant information to solve the problem, thus improving problem-solving ability and learning independence. (Djamarah, B, & Zain, 2005)

It can be concluded that in this study there is an effect of problem-based learning (PBL) learning model and learning independence together on the learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang. Furthermore, looking at the results of the further test, it is found that of the six combinations contained in the further test testing, it can be described as follows: The average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with PBL learning model and high learning independence 37.70 is higher than the average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with convention learning model and high learning independence 28.14.

The average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with PBL learning model and high learning independence 37.70 is higher than the average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with PBL learning model and low learning independence 29.71. The average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with PBL learning model and high learning independence 37.70 is higher than the average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with conventional learning model and low learning independence 28.86. The average value of learning problem solving ability of VIII grade students of SMP IT Ali bin Abu Thalib Deli Serdang taught with conventional learning model and high learning independence 28.14 is lower than the average value of learning problem solving ability of VIII grade students of SMP IT Ali bin Abu Thalib Deli Serdang taught with PBL learning model and low learning independence 29.71.

The average score of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang taught with conventional learning model and high learning independence 28.14 is lower than the average score of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Thalib Deli Serdang taught with conventional learning model and low learning independence 28.86. The average value of learning problem solving ability of VIII grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with PBL learning model and low learning independence 28.86 is lower than the average value of learning problem solving ability of VIII grade students of SMP IT Ali bin Abu Thalib Deli Serdang who are taught with conventional learning model and low learning independence 29.71. This research has been carried out as well and as perfect as possible using scientific method procedures, but it does not rule out the possibility of

limitations encountered in the implementation of the research. The limitations found include the following:

First, the teaching staff's lack of understanding in teaching the material by applying the learning steps in the PBL learning model and conventional learning model, because so far they have been patterned with learning activities based on textbooks only. Overcoming this is done by providing observation sheets for PBL and conventional learning model steps, as well as providing designs and learning treatment materials for PBL and conventional learning models. In addition, it also held discussions in overcoming the difficulties that arose during the implementation of the learning treatment. Second, this research was only conducted on one class on the PBL learning model strategy and one class on the conventional learning model, so this research cannot be generalised to a wider scope, unless the characteristics of students and teaching materials match the characteristics of this research. Third, the instruments of the problem-solving ability test results and the learning independence questionnaire have been tested for validity and reliability, but these instruments only measure the problem-solving ability and learning independence obtained by students, have not been able to measure the learning process carried out by students to get overall learning outcomes, for this research can be combined with more in-depth research through qualitative research so that learning activities can be recorded well.

Despite its limitations, the PBL learning model places students in a context where they have to identify, analyse and solve complex problems. This promotes the development of their analytical skills as they have to break down the problem into smaller parts and find suitable solutions. Students also often work in groups to solve problems. This allows them to learn from each other, share ideas, and combine their thoughts to reach a better solution. These collaborative skills are important in solving problems effectively in the real world where co-operation is often required. It is beneficial to encourage students to take an active role in their learning process. They must seek out information themselves, identify their learning needs, and develop strategies to solve the problems they face. This model can promote independent learning, where students become more independent in seeking knowledge and overcoming obstacles in the learning process. As well as students will ask questions, test assumptions, and evaluate various solutions. It promotes critical thinking, where students learn to question information, analyse arguments and make evidence-based decisions.

Creating relevant and authentic learning contexts by centred learning on solving real-world problems. This makes learning more meaningful for students as they see the direct relevance of what they are learning to situations they face in everyday life. The results also show that independent learning often encourages people to find new ways to understand and overcome problems. When people are given the freedom to learn independently, they tend to be more creative in finding innovative solutions. Learning independence also trains one to face challenges and overcome obstacles on their own. It helps in the development of mental and emotional resilience needed to solve problems that are complex and require sustained effort. Thus, the implementation of PBL learning model and learning independence has a significant positive impact on students' ability to solve problems, equipping them with the skills and knowledge they need to succeed in various contexts.

## CONCLUSION

There is an effect of the application of PBL learning model on the value of students' problem solving ability. In this case, the average value of the learning problem solving ability of VIII grade students of Ali bin Abu Talib Deli Serdang IT Junior High School taught with PBL learning model 37.30 is higher than the average value of the learning problem solving ability of class students taught with conventional learning model 28.14 with  $F_{count} = 242.4 > F_{table} = 3.972$ . There is an influence of learning independence on the value of students' problem solving ability. In this case the average value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Talib Deli Serdang with high learning independence 32.80 is higher than the value of learning problem solving ability of 8th grade students of SMP IT Ali bin Abu Talib Deli Serdang with low learning independence 29 with  $F_{hitung} = 183,8 > F_{table} = 3.972$  There is an interaction between the learning

model and learning independence, where for students with high learning independence it is more appropriate to use the PBL learning model, while students with low learning independence are more appropriate to use the conventional learning model with  $F_{hitung} = 86.3 > F_{table} = 3.972$ .

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